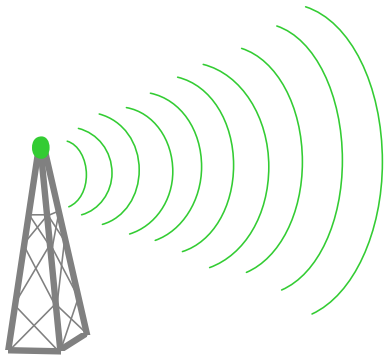
CSX TRANSPORTATION



C B T M

Communications Based Train Management

July 9, 2003

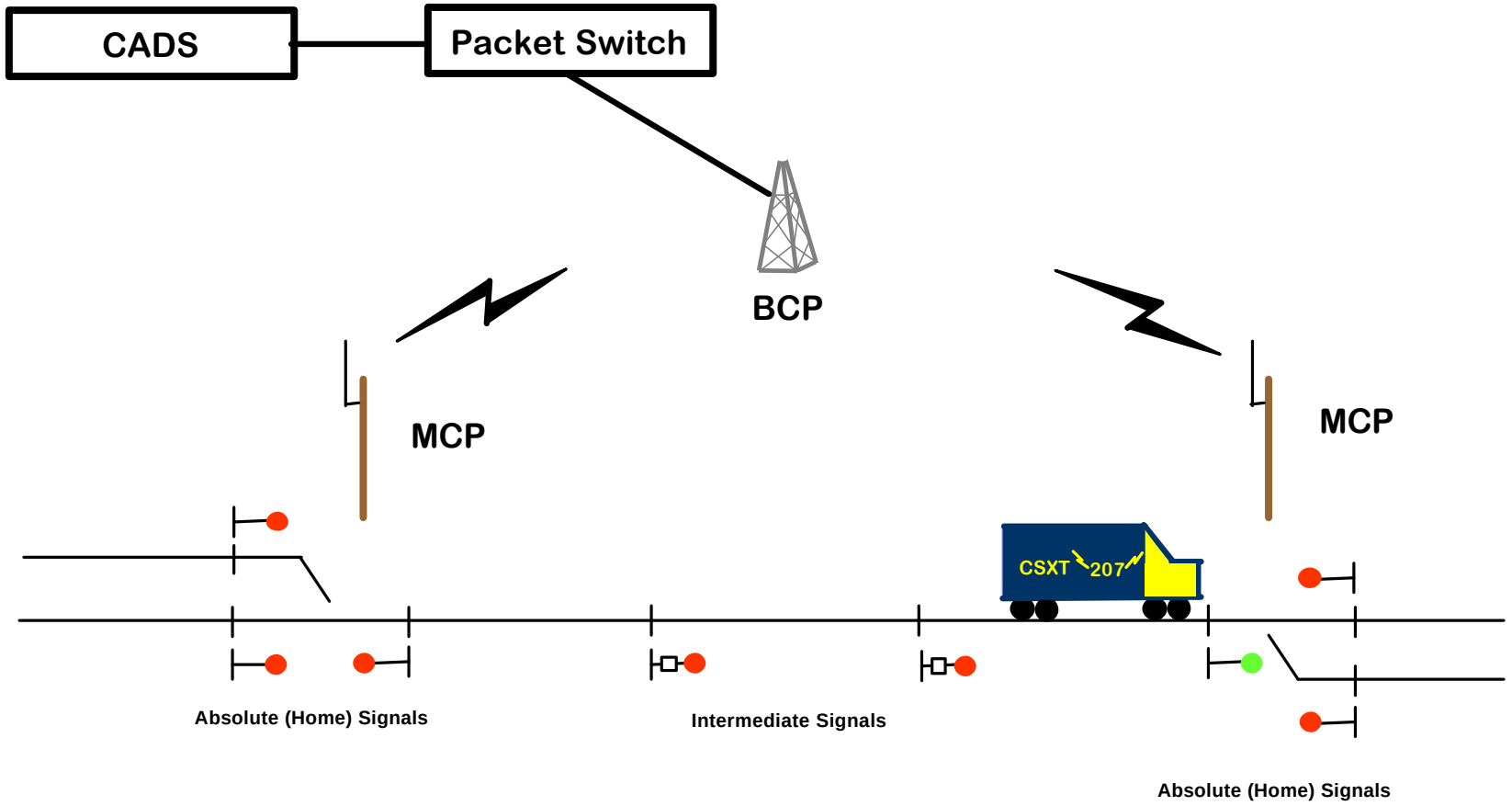
Status of 2002 CBTM Enhancements

- **Display replacement**
  - **Original six (6) equipped locomotives have been upgraded and are in service with new on-board platform**
- **Locally Controlled Power Switches**
  - **Field qualification testing complete on March 25th**
- **Installation of 50 miles of UHF ATCS Spec 200 coverage is complete**
  - **New on-board platform has been designed, developed and tested using this protocol**
  - **Goal is to leverage radio code line infrastructure**
- **Digital Display of Authorities (DDA)**
  - **Specification development has begun on dispatching system interface to done in conjunction with the Next Generation Dispatching (NGD) project**
  - **CBTM field testing has been done with a simulated interface**

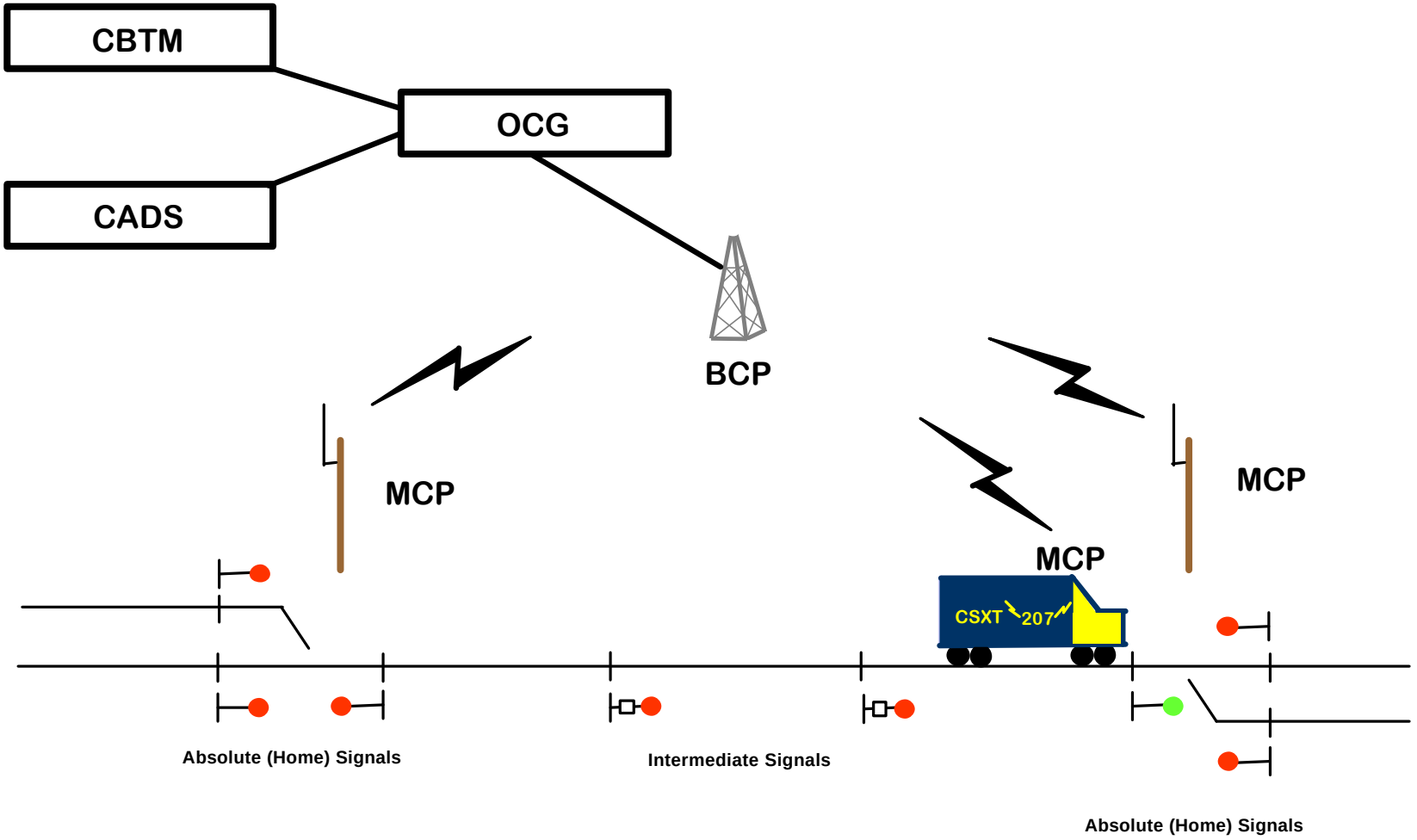
2003 CBTM Enhancement

- **TCS Development**
  - **Adapt CBTM's enforcement capabilities to signal territory on the Blue Ridge subdivision (138.6 miles)**
    - **Request to extend current pilot territory published in the Federal Register**
    - **CBTM will not replace the signal system**
      - **It will be implemented as an overlay**
    - **Development includes:**
      - **non-vital rear end protection;**
      - **an interface to the new Office Communication Gateway, and;**
      - **conversion of the on-board buss from LonWorks to Ethernet**

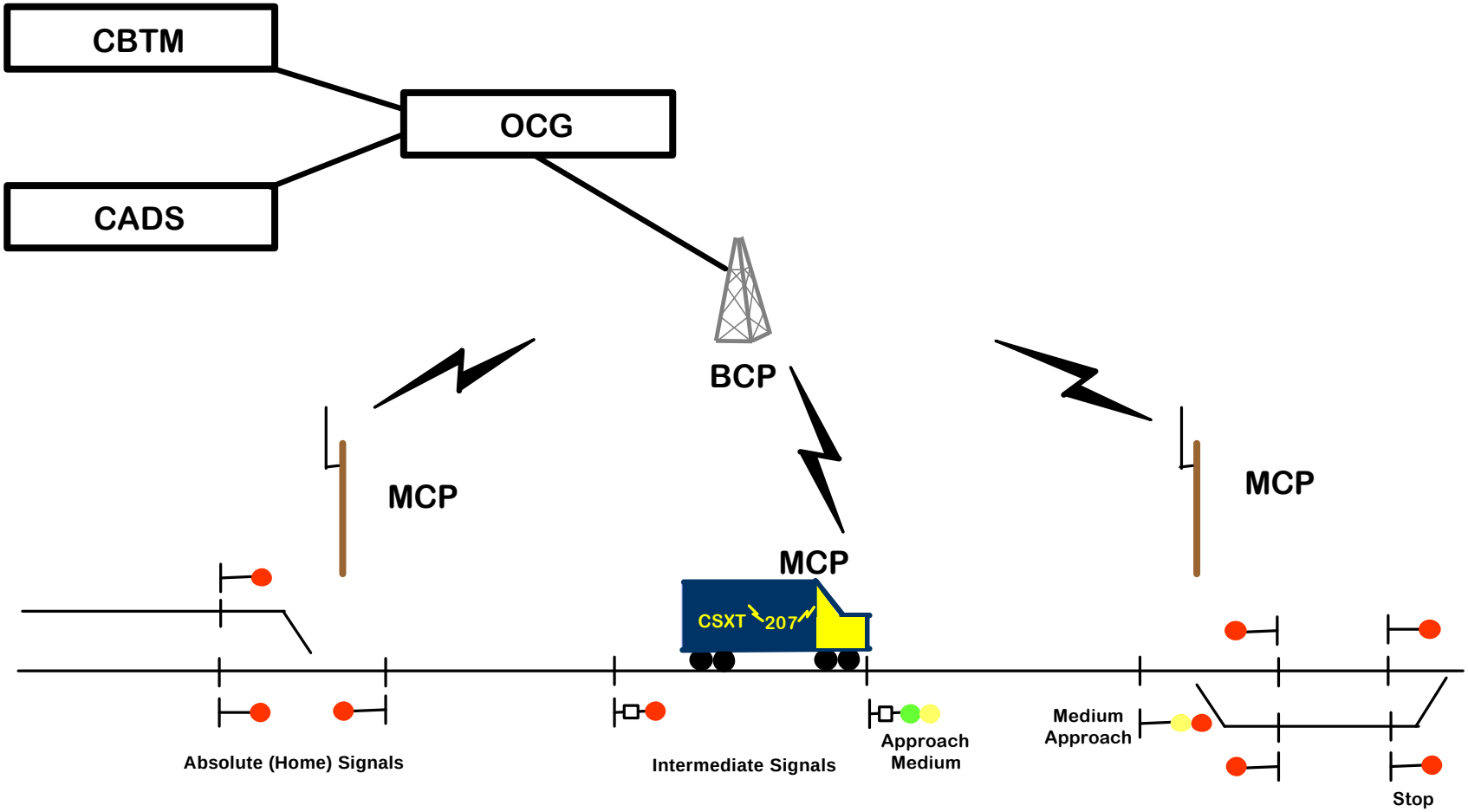
Current Configuration



Proposed Configuration



Aspects versus Indications

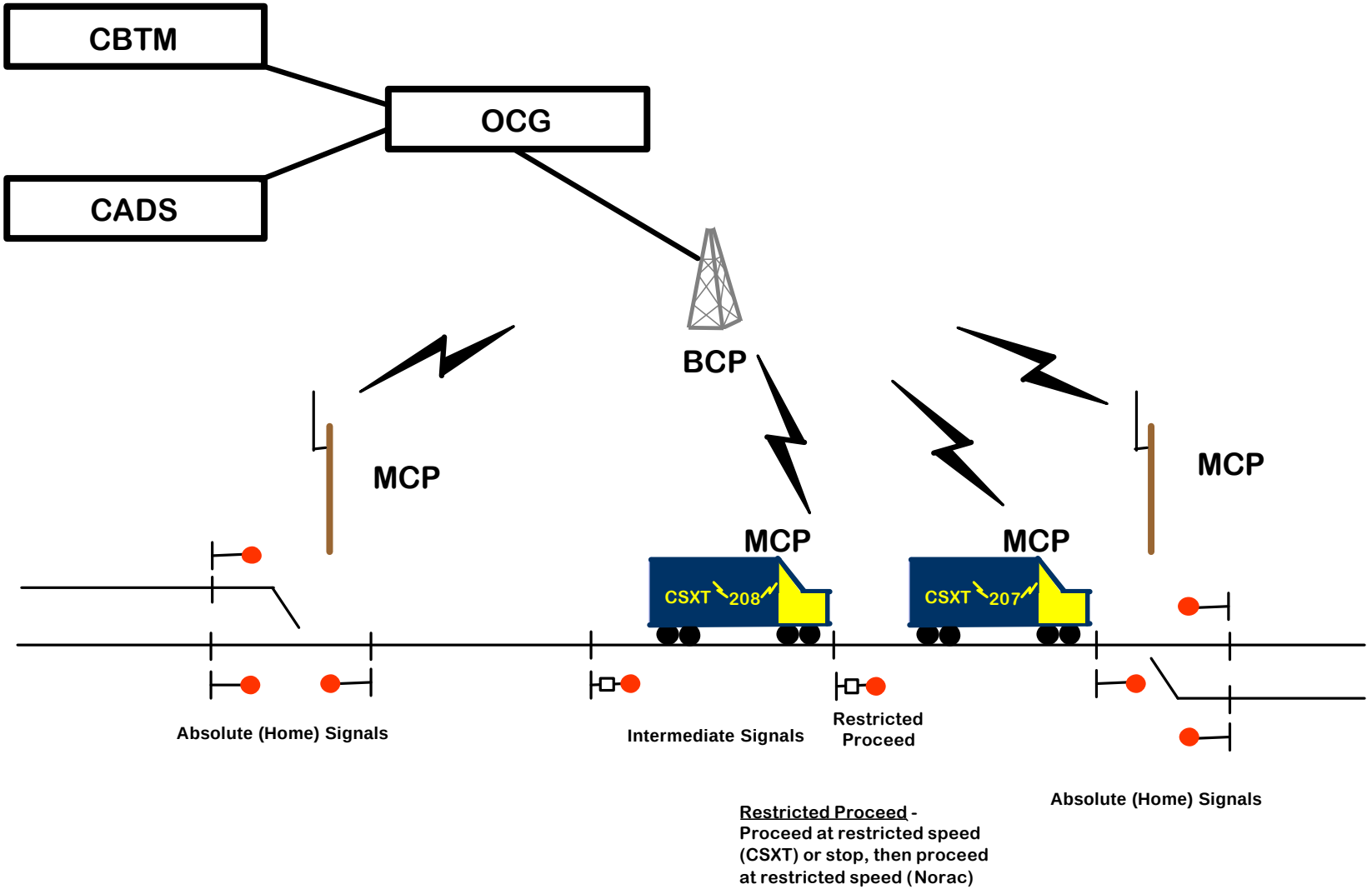


Approach Medium - Proceed, approaching next signal not exceeding medium speed

Medium Approach - Medium speed through turnouts, then proceed, prepared to stop at next signal

Stop - stop

Rear End Protection



Restricted Proceed -
Proceed at restricted speed (CSXT) or stop, then proceed at restricted speed (Norac)

CBTM TCS Functionality

CBTM will:

- **enforce a stop indication at all controlled absolute signals;**
- **allow trains to proceed at track speed past all controlled absolute signals not indicating stop regardless of aspect;**
- **allow the train to proceed after stopping at a controlled absolute signal once the crew acknowledges they have received verbal authority from the train dispatcher to proceed, if necessary;**
- **enforce restricted speed after the train passes a controlled absolute signal at stop;**
- **allow the crew to indicate their release from the restricted speed requirements;**
- **reactively enforce a train if it is within stopping distance of a controlled absolute signal when it changes to stop;**
- **treat controlled absolute signals indicating in-time as stop, and;**
- **warn but not enforce a train as it approaches a controlled absolute signal whose status is unknown.**

CBTM TCS Functionality cont'd

CBTM will:

- **enforce speeds over indicating switches based on position.**
- **enforce a train to stop as it approaches an indicating switch reporting out-of-correspondence;**
- **warn but do not enforce a train as it approaches an indicating switch whose status is unknown, and;**
- **provide rear end protection for trains that are stopped or moving at a to-be-determined speed relative to other trains that have authority to occupy the same region between controlled absolute signals either by indication or verbal permission.**

CBTM TCS Functionality cont'd

- **CBTM will not monitor:**
  - **intermediate signal locations (trains will be allowed to pass at track speed regardless of aspect);**
  - **hand-throw switches (trains will be allowed to pass at track speed regardless of position);**
  - **track occupancies (trains will be allowed to enter blocks regardless of occupancy), or;**
  - **trains entering signaled track by permission of the train dispatcher.**

In these cases, CBTM affords no additional protection over and above what is already provided by the signal system.

Other 2003 CBTM Enhancements

- **Equip 57 additional CSXT locomotives with CBTM**
  - **Locomotives will be CW44AC's in same series as CSXT 207-212, designated for coal service**
  - **Hardware will be production level**
- **Continue development of NGD interface required for the Digital Display of Authority project**
- **Aberdeen subdivision**
  - **Retirement of low density Traffic Control Signal System (TCS)**
  - **Replace with Direct Traffic Control (DTC) and CBTM**

Proposed CBTM Deployment

- 2003
  - Blue Ridge Sub
- 2004
  - Appalachian
  - Former Allegheny
  - C&O
- 2005
  - Atlanta
  - Florence
- 2006
  - Nashville
  - Former FBU
  - Jacksonville
- 2007
  - Baltimore
  - Former Cumberland
  - Detroit
  - Louisville
- 2008
  - Albany
  - Chicago
  - Great Lakes